

Population size, daily movements and nesting of the Greater Flamingo *Phoenicopterus roseus* at the Sabkhat Al-Jabboul Lake close to Aleppo, Syria

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Abstract — The Greater Flamingo *Phoenicopterus roseus* was surveyed between June 2008 and June 2009 at Al-Jabboul Lake southeast of Aleppo, Syria. Peak numbers were recorded in February (21,056) and lowest numbers in October (4,350). Up to 4,000 pairs were recorded nesting in May 2009, with 200 nests observed deserted, while others were found with chicks present in May, and later in June. Mortality of chicks was recorded with rising water levels. Known emigrants came from Italy and Iran. The main threats to the birds include hunting, collection of adults and chicks and pollution from the surrounding land. This study confirms Al-Jabboul as one of the most important sites for the Greater Flamingo in the Middle East.

Keywords: Greater Flamingo, *Phoenicopterus roseus*, survey, Al-Jabboul Lake, Aleppo, Syria, numbers, breeding, water levels, Italy, Iran, migration.

Introduction

The importance of Greater Flamingo *Phoenicopterus roseus* (locally known as Yaghnees) at Al Jabboul Lake southeast of Aleppo, Syria was first noticed early in the 1960s (Savage, 1968). Dijkzen & Koning (1972) carried out mid-winter waterbird counts in December 1971 and December 1972, and informal visits by birdwatchers helped enrich the lake's species list and provide insight into the site's ornithological significance (Wester, 1998; Vandemeutter & Soors 2001; Murdoch, 2003).

The Syrian Wetland Expedition (Murdoch *et al.*, 2004) partially covered Al-Jabboul Lake and made Greater Flamingo winter counts. The expedition reached a conclusion that the lake has one of largest winter concentrations of Greater Flamingo in the Middle East and provided the first Syrian record of breeding Greater Flamingo, with 500 breeding pairs. Serra *et al.* (2006) clarified the importance of Al-Jabboul and discussed the current, future, and potential threats. None of the previous studies covers a whole year count, and none provided a detailed pattern of Greater Flamingo occurrence at Al-Jabboul.

Unfortunately, the lake and its flora and fauna are subject to a number of threats including hunting and pollution, but more importantly limited recognition of its biological importance. In an attempt to enhance its national and international profile various suggestions have been made including the development of the site for tourism with the

provision of data on population numbers for its key species to inform the development of a management plan, especially those species which might act as flagship species for conservation. Until recently there have been no systematic surveys of any of the waterbird species. Thus, the main aim of this study was to carry out a number of surveys on the Greater Flamingo *Phoenicopterus roseus* to enhance the knowledge about the species for the purposes of conservation and management. This survey was made under the activities of the Swiss Agency for Development and Cooperation (SDC) through the funding of an eco-tourism project.

Study area

The area called Sabkhat al Jabboul is one of the most important wetland areas found in the Middle East (Serra *et al.*, 2006). It consists of a large (270 km²) wetland area or lake situated within a closed basin (5,075 km²) to the south east of Aleppo the second largest city in Syria. Due to its location, its waters are saline in many parts. During the winter, water levels rise because of heavy rains, then the lake and surrounding wetlands provide an important winter refuge for many species of waterbird and a staging post for migratory species.

A number of species also breed there during the summer (Murdoch *et al.*, 2004). Crap (1980) identified the lake as a Wetland of International Importance, Evans (1994) identified the lake as an Important Bird Area and Scott (1995) also recognised the international importance of the

wetland. The site was designated as a Ramsar Site in 1989 by fulfilling three criteria: a representative example of a natural wetland type, accommodating over 20,000 waterbirds and supporting greater than 1% of the world population of one or more species.

The lake is made up of three distinct areas of different salinity and habitat and contains up to nine permanent islands (Figure 1). Temperatures range from 2–10 °C in winter and 21–37 °C in summer. Land use around the lake varies widely but includes irrigated agriculture, sheep grazing and salt extraction.

In summer 2008, the water level was minimal. The three permanent water bodies occurred with no seasonal water. In winter, a large amount of rain water and irrigation drainage water gradually flowed into the lake, and the lake was full of water in March 2009, and that, lasted until June 2009 when the whole lake was accessible by boat.

Methods

The lake was visited on 13 separate occasions between June 2008 and June 2009. Each visit was between the 13th and 21st of each month. In summer 2008 when the water level was at its lowest, birds were counted from 30 different observation

points distributed along the shoreline of the permanent water.

In early winter when the water level had risen sufficiently to allow access by boat to a few close locations, 10 additional observation points were added to cover newly formed temporal water bodies. Two boat transects were established in the north-western lake and in Hamrat Lake, to replace the point counts in these areas, while the remaining summer point counts were kept in use.

When water levels became higher enough for full access by boat, no fixed point counts were used, and all counts were carried out by boat moving from north to south through one or more of the four transects depending on the birds' distribution and water level. When the flock showed signs of alert behaviour, the boat stopped at a safe distance not to disturb the birds, and counts took place accordingly, then the boat resumed moving to the southward until the whole area was covered.

To minimise the risk of double counts in summer, birds were counted only after they flew from night roost locations in the salt water to the brackish water where they would remain until sunset. Researchers moved smoothly between observation points on the shoreline so as not to 'push' birds ahead to the next

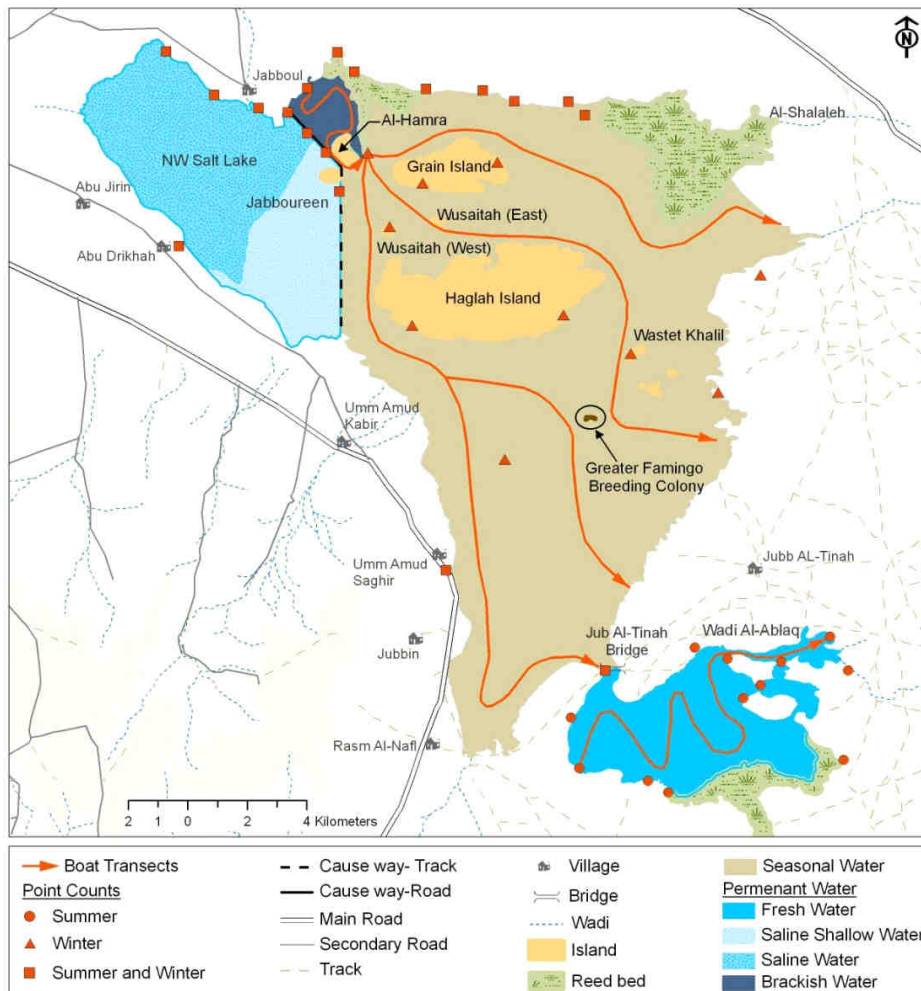


Figure 1. Seasonal and permanent water of Al-Jabboul with their classifications. Points around the shore line are those points which were used for counts in summer when the lake was dried. Points in the middle are those points that were used in early winter, in addition to shoreline

point. Reference landscape features were recorded when the count was stopped to move to the next point and when two researchers started counting large groups of flamingos.

Results

Flamingos were recorded in all months of the year. Individual monthly counts increased slowly from 4,350 in October up to a maximum of 21,056 in February (Figure. 2). From then on numbers declined to 5,000 in June.

Daily movements and links with other colonies

In terms of local movements, flamingos were seen in various parts of the lake during the day. In early morning, birds were observed feeding in the north west of the salt lake, then flew in flocks to the brackish water and continue feeding during the course of the day. At night, most roosted back in the more saline areas to the north west.

Whilst it is unknown where the majority of the birds came from, a few birds are known to have come from Italy and Iran by the recovery of rings from hunters. In 2007 one bird shot at the lake had been ringed in Italy in the same year. In 2005 and 2006, hunters recovered two birds, which had been ringed in 1989 in Iran.

Nesting birds

The previously identified breeding sites (from interviews with locals and general observations) were visited in July 2008 and found to be dry with no signs of nests or dead chicks. Flamingos were seen

breeding in May 2009 on an isolated island south east of Haglah Island (Figure 1). A total of 4,000 nests were recorded on the island with 2,000 chicks, but 200 nests appeared abandoned.

One month later, the site was found surrounded by traditional staked-noose line, and a large number of chicks was captured, a lot of eggs were deserted, and the adults were disturbed but kept close to the colony. The staked-noose line was removed, and chicks were released. The number of nests was reconfirmed to be 4000 nests. Approximately 2,000 chicks were counted. Chicks were of various sizes ranging from a few days old (diamond on the peak) up to one or two week-old. Large numbers of chicks became stranded and died in rising water levels at the nesting site.

Discussion

As Serra *et al.* (2006) indicated, Greater Flamingos are difficult to count at Al-Jabboul Lake making double counts possible. The observation of daily movements of flamingos between salt and brackish water, however, provided an opportunity to perform the counts during the time the flamingo spent in the brackish water, since it was the longest period of time the birds remained at one location.

Murdoch *et al.* (2004) performed a winter count and suggested that Al-Jabboul wetland holds one of the largest flamingo populations in the Middle East. Comparing the results of this survey with the 2005 estimation of flamingos in the eastern Mediterranean (Béchet, 2005), suggests that Al-Jabboul may host a

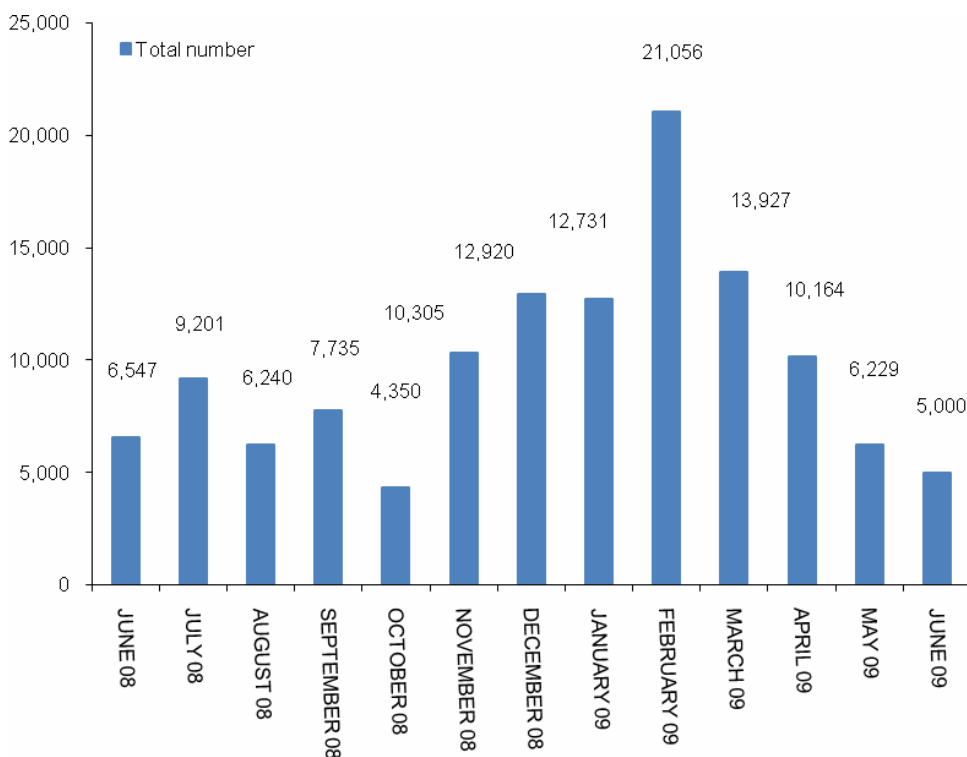


Figure 2. Numbers of Greater Flamingos *Phoenicopterus roseus* recorded at Al-Jabboul Lake between June 2008 and June 2009.

quarter of the wintering population in the region and supports the suggestion of Murdoch *et al.* (2004). However, given that there has not been a total estimate of numbers in the eastern Mediterranean since 2005, the results of this survey could not be compared with wintering numbers in the region during the study period.

The species' localised movements between the salt and brackish water is well-known to locals. The salt water of Jabboul, mainly in the northwest, contained a large amount of *Artemia salina*, one of the main food sources of the Greater Flamingo. According to locals, the Greater Flamingo flies back to the fresh water (which is brackish in reality) to wash salt from its mouth and body, to avoid salt drying on its feathers and skin. The salt water areas may also be attractive to the flamingos because of the absence of disturbance from hunters and fishermen due to low fish contents, which make it safer for the Greater Flamingo for overnight roosting.

Al-Jabboul Lake is visited by migrant Greater Flamingos from both the west and the east Mediterranean, as indicated by three ring recoveries, one from Italy and two from Iran.

The wintering population is highly dependent on water levels, which were exceptional in the year of the count (2008/09) due to the large amount of water entering the lake from irrigation and a high level of rainfall. High water levels assured the importance of the lake for Greater Flamingo.

Murdoch and Asaad documented the first flamingo breeding event for Syria in 2006 with a total of 500 pairs (Serra *et al.*, 2006). No count took place in 2007, and no breeding record occurred in 2008. In 2008, the lake had minimum seasonal water, and most of the seasonal flooded sites were dry which would have made it difficult for Greater Flamingos to find suitable nesting conditions. In 2009, the water level increased significantly, and temporal islands were formed. Greater Flamingos selected one of these islands (the island with the most difficult access and least disturbance) as their nesting site. The location of the new colony is close to the 2006 record; both are located in the south to southeastern part of Haglah Island, almost in the centre of the lake, which is the most difficult place to reach in the lake, even though it has been approached by chick collectors.

The major threats faced by Greater Flamingos at Al-Jabboul Lake are high hunting pressure and the collection of chicks, juveniles, and adults. The species is targeted by hunters all year long, although there is lower hunting pressure during summer due to the heat. Chicks and adults were collected during the breeding season to be sold as pet birds to private

farms. Staked-noose lines, a traditional trapping method, were found surrounding the breeding colony and in the feeding grounds. Pollution is a growing threat; the lake receives sewage and industry discharges from the surrounding villages and factories.

The long-term future of this important site for the conservation of the Greater Flamingo depends on addressing the threats of excessive hunting, collection and growing pollution. Encouraging tourists and birdwatchers to the site would bring economic benefits to the region. For this it is essential that the wildlife is conserved or enhanced.

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